



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,674	12/31/2001	Rahul Aggarwal	04906.P105	4068
8791	7590	12/12/2007		
BLAKELY SOKOLOFF TAYLOR & ZAFMAN			EXAMINER	
1279 OAKMEAD PARKWAY			ALAM, UZMA	
SUNNYVALE, CA 94085-4040			ART UNIT	PAPER NUMBER
			2157	
			MAIL DATE	DELIVERY MODE
			12/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/036,674

Applicant(s)

AGGARWAL ET AL.

Examiner

Uzma Alam

Art Unit

2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14, 18-21 and 56-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-14, 18-21 and 56-67 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

This action is responsive to the amendment and arguments filed September 27, 2007.

Claims 9-14, 18-21 and 56-67 are pending. Claims 9, 18 and 56 are currently amended. Claims are new 56-67. Claims 9-14, 18-21 and 56-58 represent a method for representing label switched paths.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 9-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the -written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant added the limitation distributing forwarding information bases *including network layer information*. This limitation is not taught in the specification. The specification only teaches in pp 0023 forwarding data structures which do not contain network layer information. The specification does not teach any forwarding information base that includes network layer information.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9-14, 18-21 and 56-67 are rejected under 35 U.S.C. 103(a) as being anticipated by Hama US Patent Publication No. 2004/0202171 in view of Gibson et al. US Patent No. 7,139,278. Hama teaches the invention as claimed including a method for forming label switched paths (see abstract). Gibson teaches a distributed packet processing architecture (see abstract).

As per claim 9, Hama teaches a method for a network element comprising:

maintaining for network layer switched routes interface structures each storing a set of network layer information (pp 13 and 86; Figures 2 and 9-12);

distributing each of the interface structures to a set of one or more of a plurality of routing protocol modules (distributing interface values to the routing modules; pp 17, 73, and 85);

maintaining a routing information base responsive to the plurality of routing protocol modules (mpls network routing table; pp 18, 84, 89);

maintaining for each label switched path (LSP) a forwarding data structure that is separate from the interface structures and that does not include the set of network layer information (pp 14); and

Hama does not teach distributing forwarding information bases including network layer information to each of a plurality of line cards;

Selectively distributing different ones of the forwarding data structures to different ones of the plurality of line cards to establish label forwarding information bases devoid of network layer information, said selectively distributing being done and said label forwarding information bases being created apart from distributing to the plurality of routing protocol modules and the routing information base a subset of the forwarding data structure, wherein the distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the LSP represented by the particular forwarding data structure.

Gibson teaches distributing forwarding information bases to each of a plurality of line cards (column 2, lines 38-46);

Selectively distributing different ones of the forwarding data structures to different ones of the plurality of line cards apart from distribution to the plurality of routing protocol modules and the routing information base, wherein the selective distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the LSP represented by the particular forwarding data structure (pre-establish labels for an end to end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary; column 2, lines 8-15; lines 56-65; column 3, lines 46-60; column 4, lines 9-60)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the routing of Hama with the line card processing of Gibson. One of ordinary skill in the art would have been motivated to do this to pre-establish labels for an end to

end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary (column 2, lines 8-15).

As per claim 10, Hama and Gibson teach the method of claim 9 wherein the forwarding data structure includes a first field to indicate a port, a second field to indicate a slot, and a third field to indicate a flow (pp 10, 11, 88, 90 and 91, Figures 10-12).

As per claim 11, Hama and Gibson teach the method of claim 10 wherein the port is a virtual port and the slot is a virtual slot (Virtual path identifier and Virtual circuit identifier; pp 0005, 0006, 0011).

As per claim 12, Hama and Gibson teach the method of claim 9 further comprising maintaining for each forwarding structure, a data structure that indicates an egress slot and encapsulation information (pp 58).

As per claim 13, Hama and Gibson teach the method of claim 12 wherein the data structure further indicates an egress port (pp 10, 11, 88, 90, 91 and Figures 10-12).

As per claim 14, Hama and Gibson teach the method of claim 12 further comprising distributing the egress slot and encapsulation information from different ones of the data structures to different ones of the line cards apart from distribution to the plurality of routing

protocol modules and the routing information base (pp 10, 11, 88, 90, 91 and Figures 10-12).

Claims 59-64 are rejected under the same rationale as claims 9-14 because they teach a machine readable medium for the method of claims 9-14.

As per claim 18, Hama teaches a network element comprising:

a plurality of line cards (Figure 2 (128));

a control card having stored therein, a plurality of interface structures having stored therein network layer information (Figure 2 (129));

a plurality of routing protocol modules coupled to one or more of the plurality of interface structures (routing protocol; pp 13, 86, Figure 2, and 9-12);

a routing information base coupled to said plurality of routing protocol modules (mpls network routing table; pp 17, 73, 85);

a plurality of forwarding data structures devoid of network layer information separate from the interface data structure, the plurality of forwarding data structures each having stored therein information to determine forwarding of packets from an ingress one of said plurality of line cards to an egress one of said plurality of line cards, wherein a set of one or more of said plurality of forwarding data structures include data indicating that they represent a label switched path (pp 18, 84, 89);

Hama does not teach:

a label manager to selectively distribute different ones of the forwarding data structures to different ones of the plurality of line cards and to selectively distribute a subset of plurality of

Art Unit: 2157

forwarding data structures to the plurality of routing protocol modules, wherein the selective distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the label switched path represented by the particular forwarding data structure (VPN routing information is transmitted to routers under control of VLAN (Figure 16, 405), Figure 5);

a first of said plurality of line cards having stored therein, a label forwarding information base generated from at least certain of said plurality of forwarding data structures indicating that they represent label switched paths; and a network layer forwarding information base generated from said routing information base (pp 14, 72, 87).

Gibson teaches distributing forwarding information bases to each of a plurality of line cards (column 2, lines 38-46);

Selectively distributing different ones of the forwarding data structures to different ones of the plurality of line cards apart from distribution to the plurality of routing protocol modules and the routing information base, wherein the selective distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the LSP represented by the particular forwarding data structure (pre-establish labels for an end to end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary; column 2, lines 8-15; lines 56-65; column 3, lines 46-60; column 4, lines 9-60)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the routing of Hama with the line card processing of Gibson. One of ordinary skill in the art would have been motivated to do this to pre-establish labels for an end to

Art Unit: 2157

end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary (column 2, lines 8-15).

As per claim 19, Hama and Gibson teach the network element of claim 18 wherein said information includes a slot identifier, a port identifier, and a flow identifier (pp 10, 11, 88, 90, 91 and Figures 10-12).

As per claim 20, Hama and Gibson teach the network element of claim 19 wherein the slot identifier of each forwarding structure indicates the same virtual slot and the port identifier for each forwarding structure indicates the same virtual port (pp 10, 11, 88, 90, 91 and Figures 10-12).

As per claim 21, Hama and Gibson teach the network element of claim 18 wherein the control card further has stored therein a plurality of data structures, different ones of the plurality of data structures indicating different ones of said plurality of forwarding structures, egress slots, and encapsulation information (pp 10, 11, 88, 90, 91 and Figures 10-12).

As per claim 56, Hama teaches the machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

maintaining in a control plane a first data structure that represents a label switched path (LSP), the first data structure indicating a virtual port, a virtual slot, and an identifier to distinguish LSPs of the virtual port and the virtual slot (pp 2, Figures 13-15, pp 16 and 84);

maintaining in the control plane a second data structure indicating the first data structure, a slot, encapsulation information, and an index for the slot and the encapsulation information (pp 17 and 85);

distributing the index and the encapsulation information to certain of a set of data structures within the data plane (pp 19 and 87).

Hama does not teach distributing the first data structure, the index, and the egress to certain of a set of one or more label forwarding information bases (LFIBS) [forwarding information base (FIB), Figures 5-8, column 10, lines 19-27] in a data plane, wherein the distribution is based on an ingress and an egress line card associated with the LSP.

Gibson teaches distributing forwarding information bases to each of a plurality of line cards (column 2, lines 38-46);

Selectively distributing different ones of the forwarding data structures to different ones of the plurality of line cards apart from distribution to the plurality of routing protocol modules and the routing information base, wherein the selective distribution of a particular forwarding data structure to a particular line card is based on an ingress and an egress line card associated with the LSP represented by the particular forwarding data structure (pre-establish labels for an end to end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary; column 2, lines 8-15; lines 56-65; column 3, lines 46-60; column 4, lines 9-60)

Art Unit: 2157

It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the routing of Hama with the line card processing of Gibson. One of ordinary skill in the art would have been motivated to do this to pre-establish labels for an end to end label switched path from a specified source to a specified destination such that no reprocessing of the IP header is necessary (column 2, lines 8-15).

As per claim 57, Hama and Gibson teach the machine-readable medium of claim 56 wherein the second data structure further indicates a port (pp 10, 11, 88, 90, 91 and Figures 10-12).

As per claim 58, Hama and Gibson teach the machine-readable medium of claim 56 wherein the encapsulation information includes an egress label (pp 10, 11, 88, 90, 91 and Figures 10-12).

Claims 65-67 are rejected under the same rationale as claims 56-58 because they teach a method for the machine readable medium of claims 56-58.

Response to Arguments

1. Applicant's arguments filed April 2, 2007 have been fully considered but are moot in view of the new grounds of rejection.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to 3 whose telephone number is (571) 272-3995. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Art Unit: 2157

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Uzma Alam

Ua

December 3, 2007


ARJUN K. HENRI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100